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of a positive proof. If the second be true, it might be expected that the light from the edge of the solar disk would exhibit more of these absorption bands than that from the centre, which must have traversed a smaller amount of atmosphere; but such was not found to be the case. The third supposition is favoured by the fact that the atmosphere has unquestionably much to do with the manifestation of many of these lines, and by the analogy of the bands produced by nitrous acid gas, bromine vapour, and other absorbent media. The *experimentum crucis* of observing an artificial light through a long space of air was attempted by means of the revolving light on Beachy Head, as seen from Worthing at a distance of twenty-seven miles. It gave a negative result; but on account of the great difficulty of detecting slight breaks in a faint thread of light, no great reliance is to be placed on the experiment. A similar doubt rests on the authors' observations of fixed stars, and on the non-recognition by Fraunhofer of the ordinary lines in the light of Sirius and Castor, while on the other hand he did detect D and *b* in that of other stars. The origin of these lines is still an open question.

The spectra of artificial flames sometimes exhibit bright lines coincident with the dark spaces of the solar spectrum. Thus the yellow band in the flames of soda, and several other substances, is identical in refrangibility with D; but the most remarkable case is that of charcoal or sulphur burnt in nitre; the spectrum shows three very prominent lines, two of which coincide with A and D, while a faint red line appears at B, and a group between it and A.

A map is also given of the bright lines, principally orange, that make their appearance when nitrate of strontia is placed on the ignited wick of a spirit-lamp.

IV. "On some New Volatile Alkaloids given off during Putrefaction." By F. CRACE CALVERT, Ph.D., F.R.S., &c. Received February 23, 1860.

Some eighteen months ago my friend Mr. J. A Ransome, surgeon to the Royal Infirmary, Manchester, induced me to make some researches with the view of ascertaining the nature of the products given off from putrid wounds, and more especially in the hope of

throwing some light upon the contagion known as hospital gangrene. I fitted up some apparatus to condense the noxious products from such wounds; but the quantity obtained was so small, that it was necessary for me to acquire a more general knowledge of the various substances produced during the putrefaction of animal matter, before I could determine the nature of the products from sloughing wounds. I therefore began a series of experiments, the general results of which I now wish to lay before the Society.

Into each of a number of small barrels twenty lbs. of meat and fish were introduced, and to prevent the clotting together of the mass, it was mixed layer by layer with pumice-stone. The top of each barrel was perforated in two places, one hole being for the purpose of admitting air, whilst through the other a tube was passed which reached to the bottom of the barrel. This tube was put in connexion with two bottles containing chloride of platinum, and these in their turn connected with an aspirator. By this arrangement air was made to circulate through the casks, so as to become charged with the products of putrefaction and to convey them to the platinum salt. A yellow amorphous precipitate soon appeared, which was collected, washed with water and alcohol, and dried. This precipitate was found to contain C, H, and N, but what is highly remarkable, sulphur and phosphorus enter into its composition. The presence of C, H, and N was ascertained by elementary analysis; for the sulphur and phosphorus, a given weight of the platinum salt, 0.547 grm., was oxidized with nitric acid, and gave 0.458 grm. of sulphate of baryta = 11 per cent. of sulphur, and 0.266 of pyrophosphate of magnesia = 6.01 per cent. of phosphorus. I also ascertained the presence of these two substances by heating a certain quantity of the platinum salt with strong caustic ley, when a liquid, volatile and inflammable alkaloid was obtained, whilst the sulphur* and phosphorus remained combined with the alkali and were easily detected. I satisfied myself during these researches, which have lasted more than twelve months, that no sulphuretted nor phosphuretted hydrogen was given off; and my researches, as far as they have proceeded, tend to prove that the

* Some of the platinum salt was treated with $C S_2$, which did not remove any free S, and the beautiful orange-yellow colour of the precipitate showed the absence of sulphuret of platinum.

noxious vapours given off during putrefaction, contain the N, S, and Ph of the animal substance, and that these elements are not liberated in the simple form of ammonia, and sulphuretted and phosphuretted hydrogen. I also remarked during this investigation, that, as putrefaction proceeds, different volatile bodies are given off.

Before concluding, I may add, that when the platinum salts are heated in small test-tubes, they give off vapours, some acid and some alkaline, possessing a most obnoxious and sickening odour, very like the odours of putrefaction; and that at the same time a white crystalline sublimate, which is not chloride of ammonium, is formed.

As I foresee that these researches will occupy several years, I have deemed it my duty in the mean time to lay the above facts before the Society.

March 1, 1860.

Sir BENJAMIN C. BRODIE, Bart., President, in the Chair.

In accordance with the Statutes, the Secretary read the following list of Candidates for election into the Society :—

Frederick Augustus Abel, Esq.	Joseph Cubitt, Esq.
Somerville Scott Alison, M.D.	Henry Duncan Preston Cunningham, Esq., R.N.
Alexander Armstrong, M.D.	Thomas Rowe Edmonds, Esq.
Thomas Baring, Esq.	James Fergusson, Esq.
Charles Spence Bate, Esq.	Francis Galton, Esq.
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Henry Foster Baxter, Esq.	Robert Philips Greg, Esq.
William Brinton, M.D.	John Braxton Hicks, M.D.
Edward Brown-Séguard, Esq.	Sir William Jardine, Bart.
Thomas William Burr, Esq.	Thomas Hewitt Key, M.A.
Richard Christopher Carrington, Esq.	Waller Augustus Lewis, Esq.
Alexander Ross Clarke, Capt. R.E.	Joseph Lister, Esq.
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